Instructor's Solutions Manual
to accompany

INTRODUCTORY CIRCUIT ANALYSIS

Tenth Edition

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Contents

CHAPTER 1 (Odd)

5. $12\,\cancel{\text{mi}}\left[\frac{15\,\cancel{\text{min}}}{\cancel{\text{mi}}}\right]\left[\frac{1\text{ h}}{60\,\cancel{\text{min}}}\right] = \mathbf{3\ h}$

7. CGS

9. MKS, CGS: $°\text{C} = \frac{5}{9}(°\text{F} - 32) = \frac{5}{9}(68 - 32) = \frac{5}{9}(36) = \mathbf{20°}$
K: $\text{K} = 273.15 + °\text{C} = 273.15 + 20 = \mathbf{293.15}$

11. $0.5\,\cancel{\text{yd}}\left[\frac{3\,\cancel{\text{ft}}}{1\,\cancel{\text{yd}}}\right]\left[\frac{12\,\cancel{\text{in.}}}{1\,\cancel{\text{ft}}}\right]\left[\frac{2.54\text{ cm}}{1\,\cancel{\text{in.}}}\right] = \mathbf{45.72\ cm}$

13. a. $\mathbf{15 \times 10^{3}}$ b. $\mathbf{30 \times 10^{-3}}$ c. $\mathbf{7.4 \times 10^{6}}$
d. $\mathbf{6.8 \times 10^{-6}}$ e. $\mathbf{402 \times 10^{-6}}$ f. $\mathbf{200 \times 10^{-12}}$

15. a. $(10^2)(10^2) = \mathbf{10^4}$ b. $(10^{-2})(10^3) = \mathbf{10}$ c. $\mathbf{10^9}$
d. $(10^3)(10^{-5}) = \mathbf{10^{-2}}$ e. $(10^{-6})(10 \times 10^6) = \mathbf{10}$ f. $(10^4)(10^{-8})(10^{35}) = \mathbf{10^{31}}$

17. a. $\frac{10^2}{10^3} = \mathbf{10^{-1}}$ b. $\frac{10^{-2}}{10^2} = \mathbf{10^{-4}}$ c. $\frac{10^4}{10^{-5}} = \mathbf{10^9}$
d. $\frac{10^{-7}}{10^2} = \mathbf{10^{-9}}$ e. $\frac{10^{38}}{10^{-4}} = \mathbf{1042}$ f. $\frac{(10^2)^{1/2}}{10^{-2}} = \frac{10^1}{10^{-2}} = \mathbf{10^3}$

19. a. $(10^2)^3 = \mathbf{10^6}$ b. $(10^{-4})^{1/2} = \mathbf{10^{-2}}$
c. $(10^4)^8 = \mathbf{10^{32}}$ d. $(10^{-7})^9 = \mathbf{10^{-63}}$

21. a. $(-10^{-3})^2 = 10-6$ b. $\frac{(10^2)(10^{-4})}{10} = \frac{10^{-2}}{10} = \mathbf{10^{-3}}$

c. $\frac{(10^{-3})^2(10^2)}{10^4} = \frac{(10^{-6})(10^2)}{10^4} = \frac{10^{-4}}{10^4} = \mathbf{10^{-8}}$ d. $\frac{(10^2)(10^4)}{10^{-3}} = \frac{10^6}{10^{-3}} = \mathbf{10^9}$

e. $\frac{(10^{-4})^3(10^2)}{10^6} = \frac{(10^{-12})(10^2)}{10^6} = \frac{10^{-10}}{10^6} = \mathbf{10^{-16}}$

f. $\frac{\left[(10^2)(10^{-2})\right]^{-3}}{\left[(10^2)^2\right]\left[10^{-3}\right]} = \frac{1}{(10^4)(10^{-3})} = \frac{1}{10} = \mathbf{10^{-1}}$

23. a.

+3

$$6 \times 10^{3} = \underline{0.006} \times 10^{+6}$$

−3

b.

−3

$$4 \times 10^{-4} = \underline{400} \times 10^{-6}$$

+3

c.

−2   +3   +3

$$50 \times 10^{5} = \underline{5000} \times 10^{3} = \underline{5} \times 10^{6} = \underline{0.005} \times 10^{9}$$

+2   −3   −3

d.

+5   −3   −3

$$30 \times 10^{-8} = \underline{0.0003} \times 10^{-3} = \underline{0.3} \times 10^{-6} = \underline{300} \times 10^{-9}$$

−5   +3   +3

25. a. $1.5\ \cancel{\text{min}} \left[\dfrac{60\ \text{s}}{1\ \cancel{\text{min}}}\right] = \mathbf{90\ s}$

b. $0.04\ \cancel{\text{h}} \left[\dfrac{60\ \cancel{\text{min}}}{1\ \cancel{\text{h}}}\right]\left[\dfrac{60\ \text{s}}{1\ \cancel{\text{min}}}\right] = \mathbf{144\ s}$

c. $0.05\ \cancel{\text{s}} \left[\dfrac{1\ \mu\text{s}}{10^{-6}\ \cancel{\text{s}}}\right] = 0.05 \times 10^{6}\ \mu\text{s} = \mathbf{50 \times 10^{3}\ \mu s}$

d. $0.16\ \cancel{\text{m}} \left[\dfrac{1\ \text{mm}}{10^{-3}\ \cancel{\text{m}}}\right] = 0.16 \times 10^{3}\ \text{mm} = \mathbf{160\ mm}$

e. $1.2 \times 10^{-7}\ \cancel{\text{s}} \left[\dfrac{1\ \text{ns}}{10^{-9}\ \cancel{\text{s}}}\right] = 1.2 \times 10^{2}\ \text{ns} = \mathbf{120\ ns}$

f. $3.62 \times 10^{6}\ \cancel{\text{s}} \left[\dfrac{1\ \cancel{\text{min}}}{60\ \cancel{\text{s}}}\right]\left[\dfrac{1\ \cancel{\text{h}}}{60\ \cancel{\text{min}}}\right]\left[\dfrac{1\ \text{day}}{24\ \cancel{\text{h}}}\right] = \mathbf{41.898\ days}$

g. $1020\ \cancel{\text{mm}} \left[\dfrac{10^{-3}\ \text{m}}{1\ \cancel{\text{mm}}}\right] = \mathbf{1.02\ m}$

27. a. $100\ \cancel{\text{in.}} \left[\dfrac{1\ \text{m}}{39.37\ \cancel{\text{in.}}}\right] = \mathbf{2.54\ m}$

b. $4\ \cancel{\text{ft}} \left[\dfrac{12\ \cancel{\text{in.}}}{1\ \cancel{\text{ft}}}\right]\left[\dfrac{1\ \text{m}}{39.37\ \cancel{\text{in.}}}\right] = \mathbf{1.219\ m}$

c. $6\ \cancel{\text{lb}} \left[\dfrac{4.45\ \text{N}}{1\ \cancel{\text{lb}}}\right] = \mathbf{26.7\ N}$

d. $60 \times 10^{3}\ \cancel{\text{dynes}} \left[\dfrac{1\ \cancel{\text{N}}}{10^{5}\ \cancel{\text{dynes}}}\right]\left[\dfrac{1\ \text{lb}}{4.45\ \cancel{\text{N}}}\right] = \mathbf{0.1348\ lb}$

e. $150{,}000\ \cancel{\text{cm}} \left[\dfrac{1\ \cancel{\text{in.}}}{2.54\ \cancel{\text{cm}}}\right]\left[\dfrac{1\ \text{ft}}{12\ \cancel{\text{in.}}}\right] = \mathbf{4921.26\ ft}$

f. $$0.002\,\cancel{\text{mi}}\left[\frac{5280\,\cancel{\text{ft}}}{1\,\cancel{\text{mi}}}\right]\left[\frac{12\,\cancel{\text{in.}}}{1\,\cancel{\text{ft}}}\right]\left[\frac{1\text{ m}}{39.37\,\cancel{\text{in.}}}\right] = \mathbf{3.2187\ m}$$

g. $$7800\,\cancel{\text{m}}\left[\frac{39.37\,\cancel{\text{in.}}}{1\,\cancel{\text{m}}}\right]\left[\frac{1\,\cancel{\text{ft}}}{12\,\cancel{\text{in.}}}\right]\left[\frac{1\text{ yd}}{3\,\cancel{\text{ft}}}\right] = \mathbf{8530.17\ yds}$$

29. $$299{,}792{,}458\,\frac{\cancel{\text{m}}}{\cancel{\text{s}}}\left[\frac{39.37\,\cancel{\text{in.}}}{1\,\cancel{\text{m}}}\right]\left[\frac{1\,\cancel{\text{ft}}}{12\,\cancel{\text{in.}}}\right]\left[\frac{1\text{ mi}}{5280\,\cancel{\text{ft}}}\right]\left[\frac{60\,\cancel{\text{s}}}{1\,\cancel{\text{min}}}\right]\left[\frac{60\,\cancel{\text{min}}}{1\text{ h}}\right]$$
$$= 670{,}615{,}288.1\text{ mph} \cong \mathbf{670.62 \times 10^6\ mph}$$

31. $$100\,\cancel{\text{yds}}\left[\frac{3\,\cancel{\text{ft}}}{1\,\cancel{\text{yd}}}\right]\left[\frac{1\text{ mi}}{5280\,\cancel{\text{ft}}}\right] = 0.0568\text{ mi}$$
$$t = \frac{d}{v} = \frac{0.0568\,\cancel{\text{mi}}}{\frac{100\,\cancel{\text{mi}}}{\text{h}}} = 0.0568 \times 10^{-2}\,\cancel{\text{h}}\left[\frac{60\,\cancel{\text{min}}}{1\,\cancel{\text{h}}}\right]\left[\frac{60\text{ s}}{1\,\cancel{\text{min}}}\right] = \mathbf{2.045\ s}$$

33. $$\frac{50\,\cancel{\text{m}}}{\cancel{\text{min}}}\left[\frac{60\,\cancel{\text{min}}}{1\text{ h}}\right]\left[\frac{39.37\,\cancel{\text{in.}}}{1\,\cancel{\text{m}}}\right]\left[\frac{1\,\cancel{\text{ft}}}{12\,\cancel{\text{in.}}}\right]\left[\frac{1\text{ mi}}{5280\,\cancel{\text{ft}}}\right] = 1.86\text{ mi/h}$$
$$t = \frac{d}{v} = \frac{3000\,\cancel{\text{mi}}}{1.86\,\frac{\cancel{\text{mi}}}{\text{h}}} = 1612.9\text{ h} = \mathbf{67.2\ days}$$

35. $$100\,\cancel{\text{yds}}\left[\frac{3\,\cancel{\text{ft}}}{1\,\cancel{\text{yd}}}\right]\left[\frac{12\text{ in.}}{1\,\cancel{\text{ft}}}\right] = 3600\text{ in.} \Rightarrow 3600\text{ quarters} = \mathbf{\$900}$$

37. $$d = vt = \left[600\frac{\cancel{\text{cm}}}{\cancel{\text{s}}}\right][0.016\,\cancel{\text{h}}]\left[\frac{60\,\cancel{\text{min}}}{1\,\cancel{\text{h}}}\right]\left[\frac{60\,\cancel{\text{s}}}{1\,\cancel{\text{min}}}\right]\left[\frac{1\text{ m}}{100\,\cancel{\text{cm}}}\right] = \mathbf{345.6\ m}$$

39. $$d = (86\,\cancel{\text{stories}})\left[\frac{14\text{ ft}}{\cancel{\text{story}}}\right] = 1204\,\cancel{\text{ft}}\left[\frac{1\text{ mile}}{5{,}280\,\cancel{\text{ft}}}\right] = 0.228\text{ miles}$$
$$\frac{\text{min}}{\text{mile}} = \frac{10.7833\text{ min}}{0.228\text{ miles}} = \mathbf{47.30\ min/mile}$$

41. a. $$5\,\cancel{\text{J}}\left[\frac{1\text{ Btu}}{1054.35\,\cancel{\text{J}}}\right] = \mathbf{4.74 \times 10^{-3}\ Btu}$$

b. $$24\,\cancel{\text{ounces}}\left[\frac{1\,\cancel{\text{gallon}}}{128\,\cancel{\text{ounces}}}\right]\left[\frac{1\text{ m}^3}{264.172\,\cancel{\text{gallons}}}\right] = \mathbf{7.098 \times 10^{-4}\ m^3}$$

c. $$1.4\,\cancel{\text{days}}\left[\frac{86{,}400\text{ s}}{1\,\cancel{\text{day}}}\right] = \mathbf{1.2096 \times 10^5\ s}$$

d. $$1\,\cancel{\text{m}^3}\left[\frac{264.172\,\cancel{\text{gallons}}}{1\,\cancel{\text{m}^3}}\right]\left[\frac{8\text{ pints}}{1\,\cancel{\text{gallon}}}\right] = \mathbf{2113.38\ pints}$$

43. [2nd F] [√] [(] [3] [x^2] [+] [4] [x^2] [)] [ENTER] ⇒ **5.000**

45. [2nd F] [√] [(] [4] [0] [0] [÷] [(] [6] [x^2] [+] [1] [0] [)] [)] [ENTER] ⇒ **2.949**

CHAPTER 1 (Even)

4. $50\frac{\cancel{mi}}{\cancel{h}}\left[\frac{5280 \text{ ft}}{1 \cancel{mi}}\right]\left[\frac{1 \cancel{h}}{60 \text{ min}}\right] = 4400 \text{ ft/min}$

$d = vt = \left[\frac{4400 \text{ ft}}{\cancel{min}}\right][1 \cancel{min}] = \mathbf{4400 \text{ ft}}$

8. MKS

10. $1000\cancel{J}\left[\frac{0.7378 \text{ ft-lb}}{1\cancel{J}}\right] = \mathbf{737.8 \text{ ft-lbs}}$

12. a. $\mathbf{10^4}$ b. 10^{-4} c. $\mathbf{10^3}$ d. $\mathbf{10^6}$ e. $\mathbf{10^{-7}}$ f. $\mathbf{10^{-5}}$

14. a. $4.2 \times 10^3 + 6{,}800 \times 10^3 = 6{,}804.2 \times 10^3 = \mathbf{6.8042 \times 10^6}$

b. $9 \times 10^4 + 0.36 \times 10^4 = \mathbf{9.36 \times 10^4}$

c. $50 \times 10^{-5} - 6 \times 10^{-5} = 44 \times 10^{-5} = \mathbf{4.4 \times 10^{-4}}$

d. $1.2 \times 10^3 + 0.05 \times 10^3 - 0.6 \times 10^3 = 0.65 \times 10^3 = \mathbf{6.5 \times 10^2}$

16. a. $(50 \times 10^3)(3 \times 10^{-4}) = 150 \times 10^{-1} = \mathbf{1.5 \times 10^1}$

b. $(2.2 \times 10^3)(8 \times 10^{-2}) = 17.6 \times 10^1 = \mathbf{1.76 \times 10^2}$

c. $(82 \times 10^{-6})(7 \times 10^{-5}) = 574 \times 10^{-11} = \mathbf{5.74 \times 10^{-9}}$

d. $(30 \times 10^{-4})(2 \times 10^{-4})(7 \times 10^8) = 420 \times 10^0 = \mathbf{4.2 \times 10^2}$

18. a. $\frac{2 \times 10^3}{8 \times 10^{-5}} = 0.25 \times 10^8 = \mathbf{2.5 \times 10^7}$

b. $\frac{4.08 \times 10^{-3}}{60 \times 10^3} = 0.068 \times 10^{-6} = \mathbf{6.8 \times 10^{-8}}$

c. $\frac{2.15 \times 10^{-4}}{5 \times 10^{-5}} = 0.43 \times 10^1 = \mathbf{4.3 \times 10^0}$

d. $\frac{78 \times 10^9}{4 \times 10^{-6}} = 19.5 \times 10^{15} = \mathbf{1.95 \times 10^{16}}$

20. a. $(2.2 \times 10^3)^3 = (2.2)^3 \times (10^3)^3 = 10.65 \times 10^9 = \mathbf{1.065 \times 10^{10}}$

b. $(6 \times 10^{-4} \times 10^2)^4 = (6 \times 10^{-2})^4 = (6)^4 \times (10^{-2})^4 = 1296 \times 10^{-8} = \mathbf{1.296 \times 10^{-5}}$

c. $(4 \times 10^{-3} \times 6 \times 10^2)^2 = (24 \times 10^{-1})^2 = (2.4)^2 = \mathbf{5.76}$

d. $((2 \times 10^{-3})(0.8 \times 10^{4})(0.003 \times 10^{5}))^3 = (4.8 \times 10^3)^3 = (4.8)^3 \times 10^3)^3$
$= 110.6 \times 10^9 = \mathbf{1.106 \times 10^{11}}$

22. a. $\dfrac{(3 \times 10^2)^2(10^2)}{10^4} = \dfrac{(9 \times 10^4)(10^2)}{10^4} = \dfrac{9 \times 10^6}{10^4} = 9 \times 10^2 = \mathbf{900}$

b. $\dfrac{(4 \times 10^4)^2}{(20)^3} = \dfrac{16 \times 10^8}{8 \times 10^3} = \mathbf{9 \times 10^{12}}$

c. $\dfrac{(6 \times 10^4)^2}{(2 \times 10^{-2})^2} = \dfrac{36 \times 10^8}{4 \times 10^{-4}} = \mathbf{9 \times 10^{12}}$

d. $\dfrac{(27 \times 10^{-6})^{1/3}}{21 \times 10^4} = \dfrac{3 \times 10^{-2}}{21 \times 10^4} = \mathbf{\dfrac{1}{7} \times 10^{-6}}$

e. $\dfrac{\left[(4 \times 10^3)^2\right][300]}{2 \times 10^{-2}} = \dfrac{(16 \times 10^6)(3 \times 10^2)}{2 \times 10^{-2}} = \dfrac{48 \times 10^8}{2 \times 10^{-2}} = 24 \times 10^{10} = \mathbf{240 \times 10^9}$

f. $(16 \times 10^{-6})^{1/2}(10^5)^5(2 \times 10^{-2}) = (4 \times 10^{-3})(10^{25})(2 \times 10^{-2}) = \mathbf{8 \times 10^{20}}$
$= \mathbf{800 \times 10^{18}}$

g. $\dfrac{\left[(3 \times 10^{-3})^3\right]\left[7 \times 10^{-5}\right]^2\left[8 \times 10^2\right]^2}{\left[(10^2)(9 \times 10^{-4})\right]^{1/2}} = \dfrac{(27 \times 10^{-9})(49 \times 10^{-10})(64 \times 10^4)}{(9 \times 10^{-2})^{1/2}}$

$= \dfrac{84{,}672 \times 10^{-15}}{3 \times 10^{-1}}$
$= 28{,}224 \times 10^{-14} = \mathbf{282.24 \times 10^{-12}}$

24. a. increase by (3): 2000×10^{-6} s $= \underline{2.0} \times 10^{-3}$ s $=$ **2 ms**

b. decrease by (3): 0.04×10^{-3} s $\Rightarrow \underline{40} \times 10^{-6}$ s $=$ **40 μs**

c. decrease by (3): 0.06×10^{-6} F $= \underline{60} \times 10^{-9}$ F $=$ **60 nF**

d. increase by (6): 8400×10^{-12} s $\Rightarrow \underline{0.0084} \times 10^{-6}$ s $=$ **0.0084 μs**

e. $\overset{\text{decrease by (6)}}{0.006 \times 10^3 \text{ m} = \underline{6000}} \times 10^{-3} \text{ m} = \mathbf{6000 \text{ m}}$

f. $260 \times \overbrace{10^3 \times 10^{-3}}^{10^0} \text{ m} \Rightarrow \underline{0.26} \times 10^3 \text{ m} = \mathbf{0.26 \text{ km}}$ (increase by (3))

26. a. $0.1\ \mu\text{F} \left[\dfrac{10^{-6}\ \text{F}}{1\ \mu\text{F}}\right]\left[\dfrac{1\ \text{pF}}{10^{-12}\ \text{F}}\right] = 0.1 \times 10^{-6} \times 10^{12}\ \text{pF} = \mathbf{10^5\ pF}$

b. $0.467\ \text{km} \left[\dfrac{10^3\ \text{m}}{1\ \text{km}}\right] = \mathbf{467\ m}$

c. $63.9 \times 10^{-3}\ \text{m} \left[\dfrac{100\ \text{cm}}{1\ \text{m}}\right] = 63.9 \times 10^{-1}\ \text{cm} = \mathbf{6.39\ cm}$

d. $69\ \text{cm} \left[\dfrac{1\ \text{m}}{100\ \text{cm}}\right]\left[\dfrac{1\ \text{km}}{1000\ \text{m}}\right] = \mathbf{69 \times 10^{-5}\ km}$

e. $3.2\ \text{h} \left[\dfrac{60\ \text{min}}{1\ \text{h}}\right]\left[\dfrac{60\ \text{s}}{1\ \text{min}}\right]\left[\dfrac{1\ \text{ms}}{10^{-3}\ \text{s}}\right] = \mathbf{11.52 \times 10^6\ ms}$

f. $0.016\ \text{mm} \left[\dfrac{10^{-3}\ \text{m}}{1\ \text{mm}}\right]\left[\dfrac{1\ \mu\text{m}}{10^{-6}\ \text{m}}\right] = 0.016 \times 10^3\ \mu\text{m} = \mathbf{16\ \mu m}$

g. $60\ \text{cm}^2 = 60(\text{cm})(\text{cm}) \left[\dfrac{1\ \text{m}}{100\ \text{cm}}\right]\left[\dfrac{1\ \text{m}}{100\ \text{cm}}\right] = \mathbf{60 \times 10^{-4}\ m^2}$

28. **5280 ft**, $5280\ \text{ft} \left[\dfrac{1\ \text{yd}}{3\ \text{ft}}\right] = \mathbf{1760\ yds}$

$5280\ \text{ft} \left[\dfrac{12\ \text{in.}}{1\ \text{ft}}\right]\left[\dfrac{1\ \text{m}}{39.37\ \text{in.}}\right] = \mathbf{1609.35\ m,\ 1.61\ km}$

30. $\dfrac{50\ \text{ft}}{20\ \text{s}}\left[\dfrac{1\ \text{mi}}{5280\ \text{ft}}\right]\left[\dfrac{60\ \text{s}}{1\ \text{min}}\right]\left[\dfrac{60\ \text{min}}{1\ \text{h}}\right] = \mathbf{1.7\ mph}$

32. $\dfrac{6\ \text{mi}}{\text{h}}\left[\dfrac{5280\ \text{ft}}{1\ \text{mi}}\right]\left[\dfrac{12\ \text{in.}}{1\ \text{ft}}\right]\left[\dfrac{1\ \text{m}}{39.37\ \text{in.}}\right]\left[\dfrac{1\ \text{h}}{60\ \text{min}}\right]\left[\dfrac{1\ \text{min}}{60\ \text{s}}\right] = \mathbf{2.682\ m/s}$

34. $10\ \cancel{km}\left[\frac{1000\ \cancel{m}}{1\ \cancel{km}}\right]\left[\frac{39.37\ \cancel{in.}}{1\ \cancel{m}}\right]\left[\frac{1\ \cancel{ft}}{12\ \cancel{in.}}\right]\left[\frac{1\ mi}{5280\ \cancel{ft}}\right] = 6.214\ mi$

$v = \frac{1\ mi}{6.5\ min},\ t = \frac{d}{v} = \frac{6.214\ \cancel{mi}}{\frac{1\ \cancel{mi}}{6.5\ min}} = \mathbf{40.39\ min}$

36. 55 mph: $t = \frac{d}{v} = \frac{3000\ \cancel{mi}}{\frac{55\ \cancel{mi}}{h}} = \mathbf{54.55\ h}$

65 mph: $t = \frac{d}{v} = \frac{3000\ \cancel{mi}}{\frac{65\ \cancel{mi}}{h}} = \mathbf{46.15\ h}$

38. $d = 86\ \cancel{stories}\left[\frac{14\ \cancel{ft}}{\cancel{story}}\right]\left[\frac{1\ step}{\frac{9}{12}\ \cancel{ft}}\right] = 1605\ steps$

$v = \frac{d}{t} \Rightarrow t = \frac{d}{v} = \frac{1605\ steps}{\frac{2\ steps}{second}} = 802.5\ \cancel{seconds}\left[\frac{1\ minute}{60\ \cancel{seconds}}\right] = \mathbf{13.38\ minutes}$

40. $\frac{5\ min}{mile} \Rightarrow \frac{1\ \cancel{mile}}{5\ min}\left[\frac{5{,}280\ ft}{1\ \cancel{mile}}\right] = \frac{1056\ ft}{minute}$, distance $= 86\ \cancel{stories}\left[\frac{14\ ft}{\cancel{story}}\right] = 1204\ ft$

$v = \frac{d}{t} \Rightarrow t = \frac{d}{v} = \frac{1204\ ft}{1056\ \frac{ft}{min}} = \mathbf{1.14\ minutes}$

42. [6] [×] [(] [4] [+] [8] [)] [ENTER] ⇒ **72.000**

44. [2nd] [$\tan^{-1}$] [(] [4] [÷] [3] [)] [ENTER] ⇒ **53.13**